

MORTON (T. S. K.)

al

RADICAL TREATMENT OF HYDROCELE.*

By THOMAS S. K. MORTON, M. D.,

PROFESSOR OF SURGERY IN THE PHILADELPHIA POLYCLINIC.

It is intended upon this occasion to briefly outline the methods of radically treating hydrocele of the tunica vaginalis, in the adult, and to give a summary of conclusions arrived at from a recent study of the literature of the subject combined with the writer's personal experience. But, in passing, it may be remarked that aseptic tapping or aspiration of a simple hydrocele is still the popular and best method of treatment, when radical cure, for any reason, is not to be attempted.

Those radical methods which may fairly be considered obsolete and undeserving of remark are: by setons, tents, caustics, or by the injection of alcohol, port wine, chloride of zinc, perchloride of iron or hot water. Practically the only procedures used at present in attempting the radical cure of hydrocele may be conveniently divided into four principal methods. These are:

1. Tapping and injection of tincture of iodine.
2. Tapping and injection of carbolic acid.
3. Incision and subsequent drainage.
4. Incision and excision of parietal layer of tunica vaginalis.

Tapping and subsequent injection of tincture of iodine was introduced by Ronald Martin in 1832 and at once attained almost universal popularity. This preëminence was retained almost without challenge until the methods of carbolic acid injection and aseptic incision were introduced a few years ago. The general employment of the iodine

*Reprinted from THE PHILADELPHIA POLYCLINIC, Vol. I, No. 3, September, 1892.



injection has since been steadily, but by no means rapidly, upon the decline.

The method of injecting iodine is as follows: The sac is emptied of all fluid by tapping in the usual manner after the parts have been well scrubbed and douched with 1-1000 bichloride solution. The canula of the trocar is left in position and a syringe that snugly fits it is applied and from 3j to ʒiv of *pure* tincture of iodine (according to size of the sac) is injected into the hydrocele cavity. A finger is then placed over the opening of the canula and the latter withdrawn, leaving all of the iodine within the sac. It is important to do this in such a manner that none of the iodine will get into the cellular tissues as the instrument is withdrawn. Abscess or sloughing may follow this accident. After the canula has been thus carefully removed the scrotum is manipulated for a few seconds so as to work the irritating injection over all portions of the tunic. The wound made by the trocar should be protected with an ordinary antiseptic dressing, or by a small six-ply square of aseptic gauze, plastered down by collodion.

This injection is usually accompanied by intense pain and more or less shock. Subsequently plastic inflammation ensues and, if the case does well, the cavity of the tunica vaginalis is obliterated by universal adhesion of its walls. Prof. Simes has proposed the injection of several drachms of cocaine solution into the cavity after tapping, leaving it there for a few moments and then allowing it to run out through the canula before injecting the iodine, with the object of avoiding the intense pain that arises when the irritant is thrown in. This certainly accomplishes its object but has proved to be a very doubtful expediency owing to the erratic and sometimes fatal constitutional effects of cocaine, especially when it is accidentally injected into the cellular tissues. Dr. Simes himself has abandoned its use in this connection. Drs. Weir and Gordon Buck have advocated rough manipulation of the scrotum on the second or third day after injection when inflammation is at its height and claim by this means to secure a larger percent-

age of permanent cures. But, for obvious reasons, they have had few followers.

By the iodine injection method about 80 per cent., of cases suited for it (see conclusions) are radically cured, and, when done aseptically, complications are uncommon. The patient is disabled for from one to two weeks.

Carbolic acid was proposed as a substitute for the iodine injection, by the late Dr. Richard J. Levis of Philadelphia, in 1881. This agent has steadily been increasing in professional esteem from that time to the present. By it, pain and shock are all but eliminated, complications are rare, the patient is not usually incapacitated for more than a day or two, and permanent cures are more frequent than where iodine is employed.

The acid is introduced by means of a syringe with a nozzle which almost fits the canula and long enough to project into the sac a quarter of an inch beyond the end of the canula. Pure carbolic acid, the crystals melted with five per cent. of glycerin, is employed. More dilute solutions are prone to induce suppuration or sloughing. From mxx to zj of this mixture, according to the size of the hydrocele, is injected and allowed to remain in the sac. The syringe and canula are then withdrawn and the scrotum manipulated for a few seconds so that the acid shall be brought into contact with all portions of the sac. The trocar wound is dressed in the usual manner. It is well to direct the patient to lie down for two or three days or until the soreness and swelling that appear on the second day begin to subside.

The more rational and modern treatment of hydrocele dates from the year 1876, when Volkmann introduced the operation of aseptic incision and drainage of the hydrocele sac. This is performed in the following manner: The scrotum and pubis are shaved, scrubbed, and douched with 1-1000 bichloride of mercury solution. The patient is then etherized and a vertical incision to the full length of the cyst is made upon the anterior surface of the scrotum. This is carried down to and into the sac, which is then divided

to the full length of the skin incision. Clip forceps are put upon all bleeding points and the interior of the tunic examined for other cysts, cartilaginous deposits, or evidences of testicular disease. A small percentage of hydroceles will be found to consist of more than one cyst. These should be successively opened by knife or scissors and scraped out.

Careful inspection will frequently reveal the presence of numerous very small cysts taking origin around the globus major or minor. These should be sought for, and, if found, opened and curetted out. Loose cartilaginous bodies or attached plates of cartilage, or bone, or even hairs, or actual dermoid cysts are occasionally found within a hydrocele sac. These when present should always be carefully dissected out. Excision of portions of the sac may be necessary to thoroughly eradicate these growths. Next, all hemorrhage is to be checked by fine cat-gut ligatures and, after a washing with 1-1000 bichloride solution, sutures are introduced in such a manner as to unite the edges of the skin and sac wall along each side of the scrotal incision from end to end. A rubber drain tube of one-quarter inch calibre is then introduced to the uttermost recess of the cavity and cut off one-half inch outside the wound. A copious dressing of bichloride gauze is finally applied to the entire scrotum and secured by a suitable gauze bandage.

This dressing should be renewed at least every second day or whenever it becomes soiled by excrement or otherwise. At each dressing the wound should be washed or sprayed out with peroxide of hydrogen (full strength) solution, and, afterwards, with a 1-2000 mercuric chloride solution. The drain tube should be shortened half an inch every second day, and even more rapidly if pushed up by granulations from the bottom of the wound. In about ten days or two weeks the granulations will be level with the surface and cicatrization will proceed rapidly. If the narrow line of granulations which finally remains to mark the line of incision is tardy in cicatrizing or if they become exuberant it is well to paint them with the nitrate of silver stick.

In from ten days to three weeks after operation by this method the patient should be able to resume his occupation. He should however be advised to wear a suspensory bandage until all swelling has departed from the scrotum and cord. Suppuration and inflammation are practically the only complications that ever occur and must be met, when they unfortunately do occur, by frequent dressings, vigorous use of the hydrogen peroxide and bichloride solutions, cutting away all sutures, and dustings with iodoform or aristol.

Burgmann in 1885 modified Volkmann's operation by excising the parietal layer of the tunica vaginalis and suturing the wound closely about the drain tube. The tube is removed on the second day and primary union is expected. I am informed by Dr. John Ashhurst, Jr. that the late Dr. Henry H. Smith of Philadelphia was accustomed to excise the parietal layer of the sac in treating hydroceles radically for many years before Bergmann published his paper on the subject.

This operation has not become as popular as was at first expected for a number of reasons. Chief of these are: the procedure is often an exceedingly difficult one; the testicle or cord may be injured or deprived of sufficient blood supply and subsequently slough or atrophy; hemorrhage is sometimes troublesome; complications are not infrequent; some recurrences take place; and, finally, while the operation is so much more severe and difficult than simple incision and drainage it is no more successful in producing cures than is the more simple and less dangerous method of Volkmann.

The judgment of the writer is therefore in favor of the operation of a simple incision and drainage as advocated by Volkmann with this modification. Instead of the drain tube (which occasionally permits primary union of portions of the sac wall which later become retention cysts or new hydroceles) gauze packing of the entire sac cavity is resorted to. One long strip of iodoform gauze, one and one-half inches broad, is gently packed into every recess of the sac until the whole is distended. This packing is removed

every second day and replaced in diminishing quantities as granulations spring up from all sides of the sac; in other words, the sac as such is destroyed and replaced by connective tissue, thus ensuring a permanent cure. For if no secreting membrane remains no fluid will be poured out after the wound has closed and it will be impossible for a hydrocele to reform. If this modification of the Volkmann method is employed the time required to effect a cure is not extended and the necessity for doing Bergmann's operation will only arise in certain cases where the vaginal tunic is infiltrated with cartilaginous or calcareous material, or otherwise seriously diseased.

CONCLUSIONS. 1. Simple tapping, the injection of tincture of iodine or carbolic acid, and aseptic incision (with or without excision of a portion of the sac) are alone employed to any extent in the modern radical treatment of hydrocele.

2. Although other injection materials—notably bichloride of mercury solution and iodoform—have been commended, yet clinical proofs of their efficiency are lacking.

3. Simple tapping, under full antiseptis, may be relied upon to *relieve* any hydrocele and will cure a small percentage of cases.

4. The injection of moderate amounts of tincture of iodine (ʒj to ʒiv) or carbolic acid (℥xx to ʒj) will cure about 85 per cent. of the *simplest forms* of hydrocele. These two agents appear at present to stand almost upon an equality as regards percentage of cures and complications, but the acid has the advantages of not giving rise to pain or shock and produces a much shorter period of disability; it appears also to be steadily gaining in popularity, and has cured many cases where the previous use of iodine had failed.

5. Cocaine should not be employed to prevent the pain incident to injecting iodine, on account of its erratic and occasionally fatal constitutional effects.

6. The following conditions should prohibit any attempt at radical cure by irritant injections:

a. disease of the testicle or cord.

- b. hydrocele complicated by hernia or the presence of a hernial sac, or where there is any doubt as to the relations of the hydrocele sac.
- c. the presence of multiple cysts.
- d. cloudiness of contained fluid.
- e. thickening or tuberculosis of the cyst walls.
- f. presence of considerable pain.
- g. presence of syphilis, tuberculosis or any depraved physical condition. Potassium iodide will cure most hydroceles of syphilitic origin.
- h. where communication with the abdominal cavity cannot be excluded.
- i. the failure of previous attempts to cure in this manner.
- j. great size of cyst.
- k. extreme old age or where the cyst is developed in childhood.

7. A considerable time should be allowed to pass after reaccumulation of fluid following injection before undertaking other treatment as the effusion is apt to be inflammatory and to disappear in time.

8. While many complications and even deaths resulting from attempted radical cure by the injection method are on record, yet most of these can be traced to violation of the above mentioned contraindications, to the employment of too large a quantity of the irritant, to the neglect of anti-sepsis, and to injecting into cellular tissue.

9. The method of tapping and injection is the method *par excellence* for those not familiar with the technique of surgery.

10. Permanent cure may be anticipated with almost absolute certainty where the operation of incision and packing of the sac is performed. Failures under the Volkmann method can often be traced to:

- a. overlooking small secondary cysts or cartilage-like bodies, or failure to recognize disease of the testicle or cord.
- b. attempting to secure primary union.

c. too early removal of the drain tube where that method of drainage has been made use of.

d. too small an incision.

11. The substitution of gauze packing for the drain tube in Volkmann's operation will probably prevent most of the complications that have been reported, and secure, with proper attention to minute secondary cysts, a uniformly radical and safe cure.

12. The death rate from simple incision and drainage is no greater than is that from injection of iodine. Sepsis and careless hemostasis are responsible for almost all complications and reported fatalities.

13. Excision of a portion of the sac—Bergmann's operation—is probably unnecessary and unjustifiable except where the tunic is exceedingly thickened or otherwise extensively diseased, as when containing calcareous patches or tubercular infiltration.

14. Incision of the sac may be performed under any of the conditions which contraindicate irritant injections except extreme youth, and certain constitutional conditions.

15. In double hydrocele both should never be injected at the same time, but double incision may be done when the local and general conditions are favorable.

16. A radical cure can only be promised when incision is employed.